Welcome to
The Kinetic Physics in ICF Workshop

Organizers: Hans Rinderknecht, Scott Wilks, Peter Amendt

April 5 – 7th, 2016
Lawrence Livermore National Laboratory

Introduction to the workshop
H.G. Rinderknecht
Tuesday, April 5, 8:30 am

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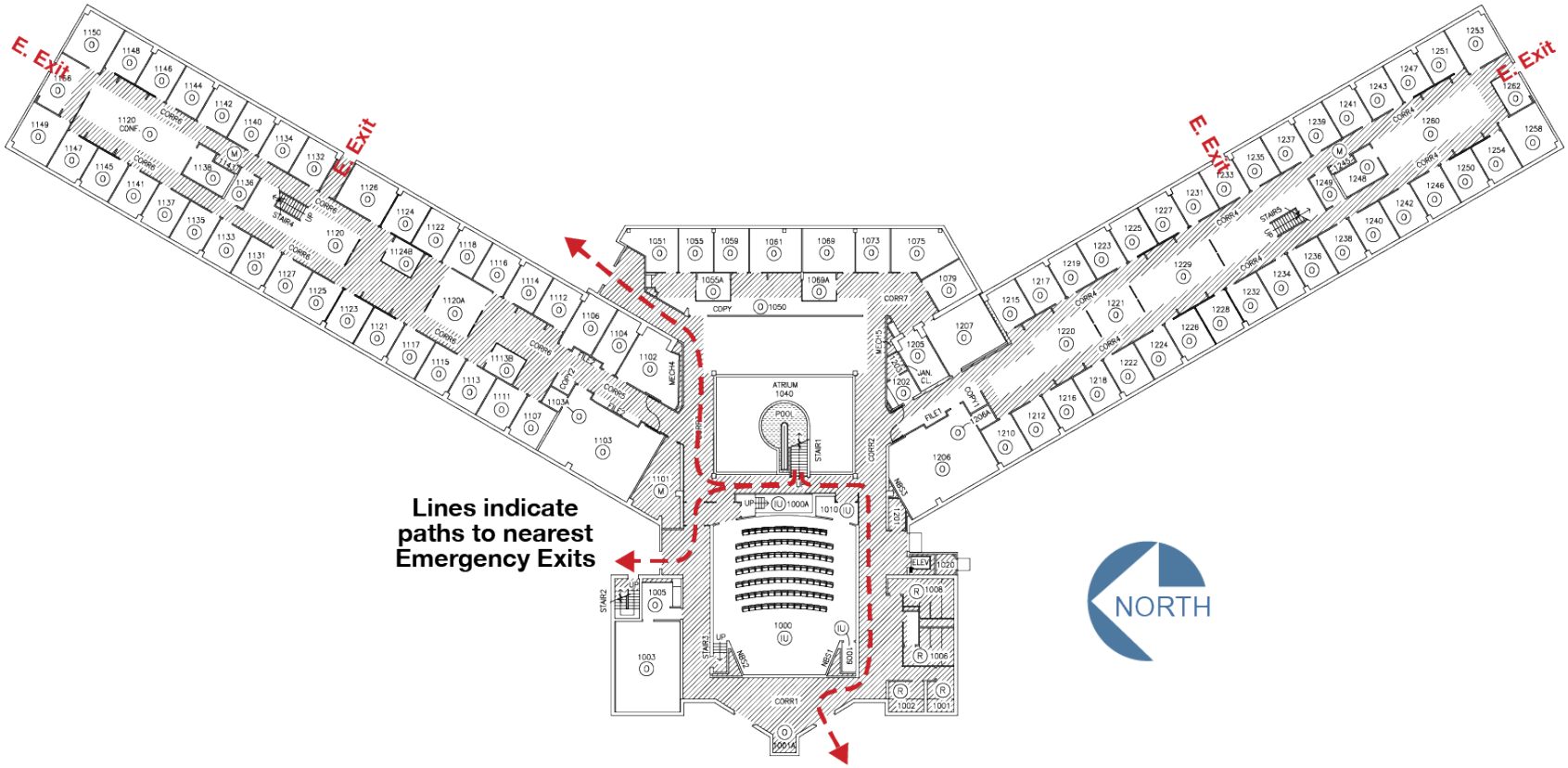
Pre-event emergency safety brief

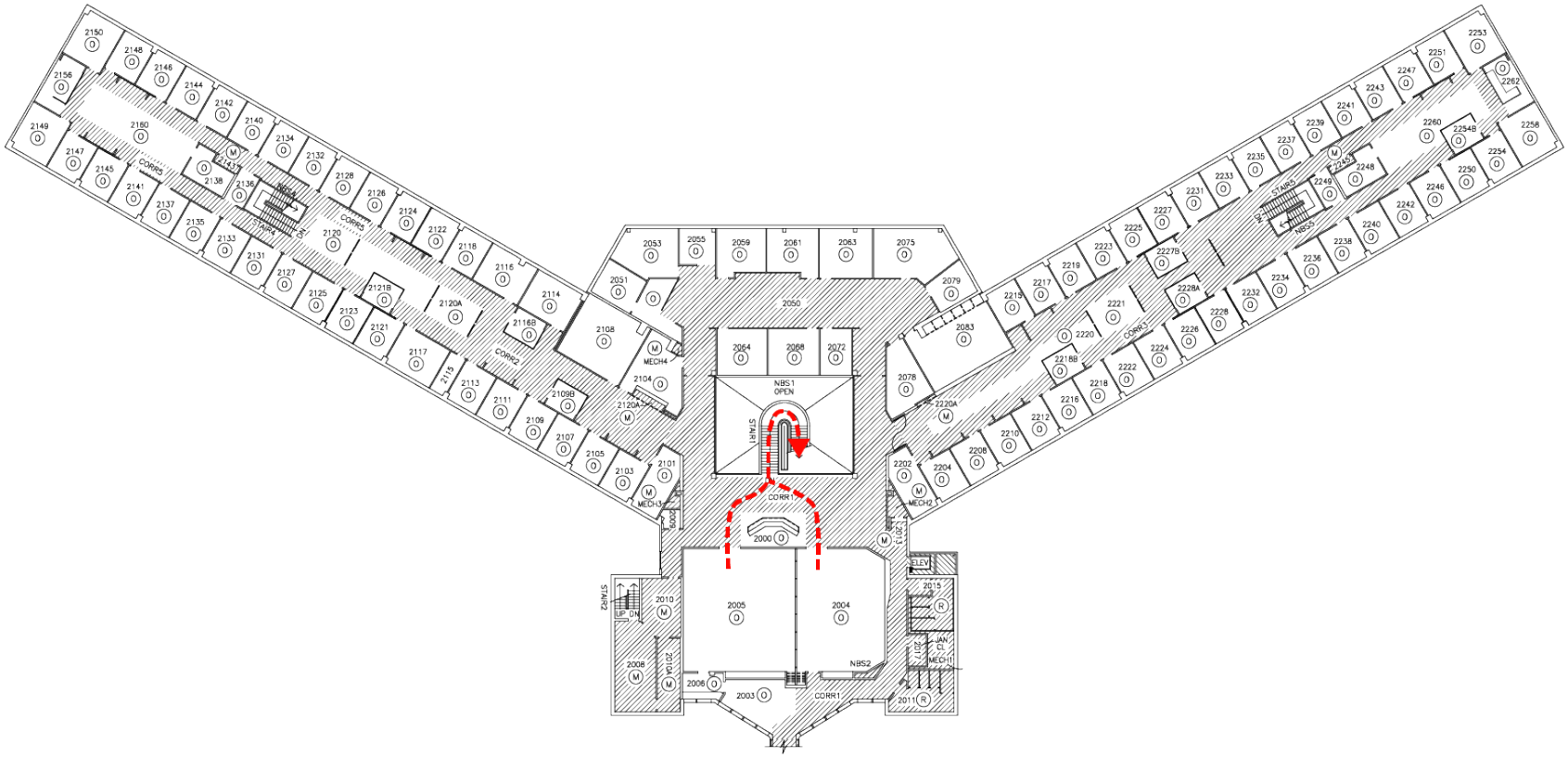
- Evacuation
  - If an earthquake occurs during the event, we will evacuate to the parking lot outside of this building
- First Aid Kit
  - There is a first aid kit and an Automated External Defibrillator (AED) available in the building
- Shelter-in-Place
  - Should there be a need to Shelter-in-Place, we will remain inside the building unless directed to move elsewhere
- Phone Numbers
  - To report an EMERGENCY, please dial 911 from a Lab phone or (925) 447-6880 from a cellular phone
  - Sandi Costa - Administrative POC (925) 784-4482
  - Conference Center Reception Desk — (925) 422-5299 or (925) 422-5250

Thank you

Building 481 first floor emergency exits and services



Building 481 second floor emergency exits and services



Goals of the Kinetic Physics in ICF workshop 2016:

1. **Assemble and present the evidence** for non-fluid-like phenomena in ICF
2. **Summarize the status of analysis and numerical techniques** for studying non-fluid-like phenomena in ICF
3. **Map out an experimental and computational plan** that enables informed judgment and quantitative assessment on the role of kinetic phenomena in ICF pertaining to the NIF

Outcomes:

- **White paper** summarizing the findings of the workshop
- **Program of experiments, simulations, and collaborations needed** to make significant progress on the assessment of kinetic effects on ignition

For Proposed Experiments & Simulation efforts:
Please send me 1 slide describing the proposed work.
We will go over these proposals on Thursday afternoon.

Questions to guide the discussion:

1. **Importance:** How would this phenomenon impact the performance of an ICF implosion?
   - How would it impact observables?
   - What simple calculation or test simulation supports the proposed impact(s)?

2. **Demonstration:** What proposed experiment or test problem would clearly demonstrate or benchmark this effect?

For simulations:

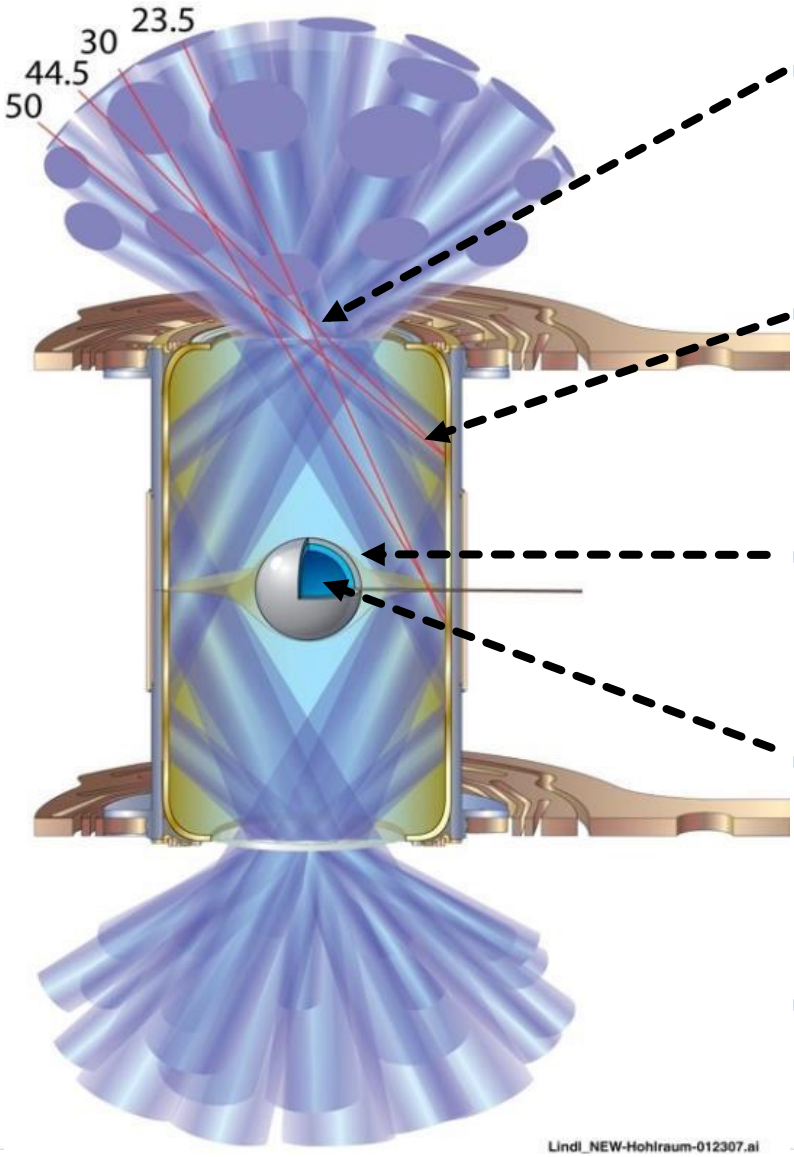
3. **Capability:** What are the code's strengths and limitations in modeling ICF implosions or test-problems of interest?

4. **Verification:** What development and benchmarking needs to be done?

Summary of the workshop agenda

- Tuesday: **Experimental evidence**
  - 8:30 – noon Presentations Auditorium (R1000)
  - *Noon* *Workshop Photograph* *Atrium*
  - 1:30 – 3:10 Presentations Auditorium
  - 3:30 – 5:00 Discussion session Upstairs (R2004-2005)
- Wednesday: **Simulation capabilities and results**
  - 8:30 – 12:10 Presentations Auditorium
  - 1:30 – 3:10 Presentations Auditorium
  - 3:30 – 5:00 Discussion session Upstairs
- Thursday: **Theory progress and proposals**
  - 8:30 – 12:10 Presentations Auditorium
  - 1:30 – 3:00 Discussion session Upstairs
  - 3:15 – 5:00 Summary and discussion Upstairs

Likely regions in ICF where kinetic physics may be important:



- LEH and laser/gas interactions
- Hohlraum gas/wall interface
- Ablator
- Shock dynamics, hot spot assembly, burn
- Other

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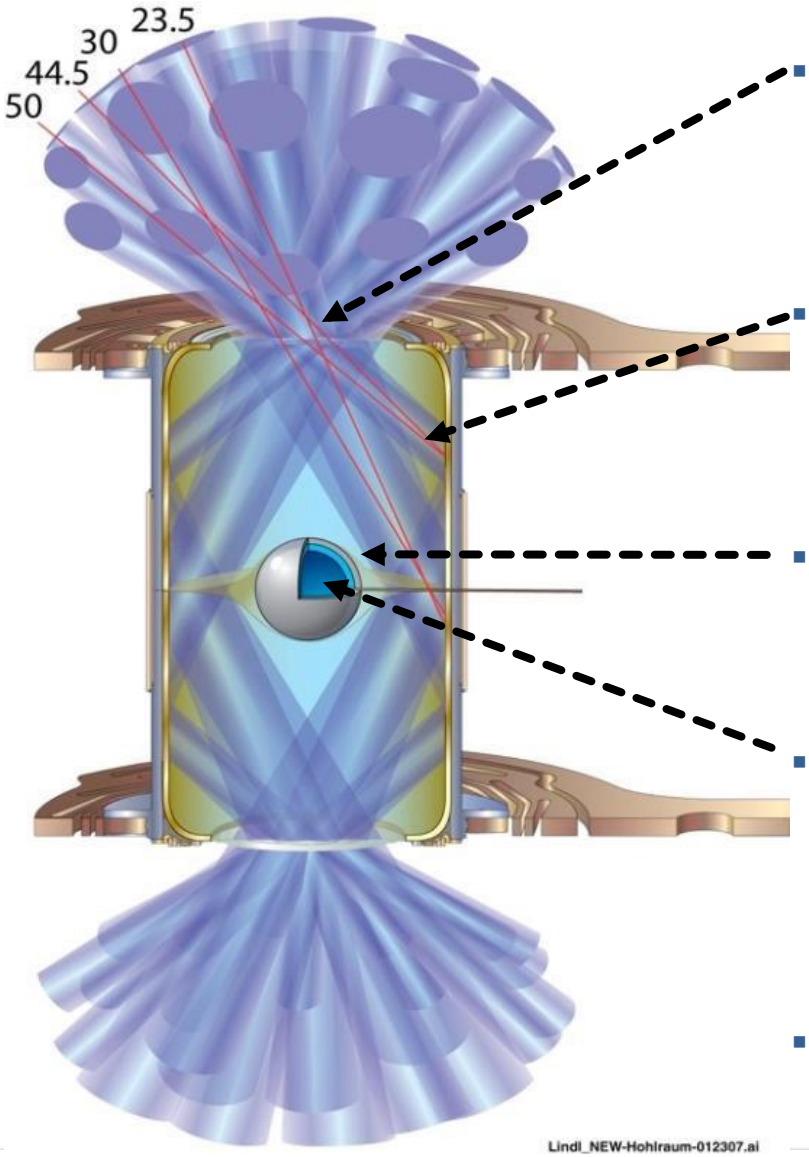

- **LEH and laser/gas interactions**
  - *non-thermal electrons*
  - *multispecies diffusion*
  - *B-field structures*
  - *…*
- **Hohlraum gas/wall interface**
  - *multispecies: diffusion*
  - *temperature inversion*
  - *E-field structures*
  - *…*
- **Ablator**
  - *multispecies: diffusion/separation, energy partition, entropy production*
  - *EOS, state change, spallation*
  - *…*
- **Shock dynamics, hot spot assembly, burn**
  - *multispecies: diffusion/separation, energy partition, entropy production*
  - $N_K = (\lambda_{ii} / R) \sim 1$
  - *e-i, i-i equilibration*
  - *stopping power*
  - *…*
- **Other**